In the Claims:

The claim listing is as follows, replacing all previously presented listings.

1. (Currently amended) A method of preparing stable, purely synthetic, self-assembling, controlled release, polyethylene oxide (PEO)-based polymersome vesicles having a semi-permeable, thin-walled, amphiphilic, high molecular weight PEO-based block copolymer encapsulating membrane and at least one active agent encapsulated therein, said method comprising:

determining the appropriate blend ratio (mol %) of hydrolysable PEO-block copolymer of at least one hydrophilic component and at least one more hydrophobic PEO-block copolymer component to produce amphiphilic high molecular weight PEO-based polymersomes having a desired controlled release rate of the encapsulated encapsulant;

selecting the at least one hydrolytically degradable, hydrophobic block copolymer to effect controlled polyester chain hydrolysis in the membrane, such that when combined with hydrophilic PEO, the PEO volume fraction (f_{EO}) and chain chemistry control encapsulant release kinetics from the copolymer vesicles and polymersome carrier membrane destabilization; and

blending in aqueous solution said at least one hydrophilic PEO-block copolymer together with the at least one inert, hydrophobic ~~PEG-block~~ PEO-block copolymer to produce amphiphilic high molecular weight PEO-based polymersomes having the desired controlled release rate of the at least one encapsulant contained therein.

2. (Currently amended) The method of claim 1, wherein the polyethylene oxide component of the block copolymer is polyethylene glycol (PEG)~~, or structural equivalent thereof~~.

3. (Original) The method of claim 2, wherein the at least one hydrophilic block copolymer comprises a block copolymer of PEG and a hydrolytically degradable polyester.

4. (Currently amended) The method of claim 3, wherein the hydrolytically degradable polyester comprises a high molecular weight polyester of polylactic acid (PLA)~~, which when combined~~

~~with PEG forms PEG-PLA,~~ or a high molecular weight polycaprolactone (PCL)~~, which when combined with PEG forms PEG-PCL~~.

5. (Original) The method of claim 1, wherein the at least one inert, non-hydrophilic block copolymer comprises polybutadiene.

6. (Currently amended) The method of claim 1, further comprising increasing the ~~mole fraction (mol %)~~ mol % of the at least one hydrolytically degradable block blended into the inert copolymer to directly control release of the encapsulant upon subsequent hydration.

7. (Original) The method of claim 6, wherein increasing the block f_{EO} increases rate of transformation into a detergent-like moiety, thereby accelerating destabilization of bilayer morphology of the polymersome membrane and encapsulant release.

8. (Original) The method of claim 1, further comprising selecting the at least one polyester for biocompatibility.

9. (Original) The method of claim 1, wherein the at least one encapsulant is an amphiphilic or lipophilic composition.

10. (Currently amended) The method of claim 1, wherein the at least one encapsulant ranges in molecular weight from ~~less than~~ 10^2 Da to ~~more than~~ 10^5 Da.

11. (Currently amended) The method of claim 1, wherein increasing molecular weight of the at least one encapsulant decelerates rate of release from the polymersome carrier~~, but the f_{EO} and polyester selection primarily dictate release kinetics~~.

12. (Original) The method of claim 9, wherein the at least one encapsulant is a hydrophilic encapsulant encapsulated in the lumen of the polymersome, or the at least one encapsulant is a hydrophilic encapsulant encapsulated by intercalation into the polymersome membrane, or there is more than more encapsulant selected from one or more hydrophilic encapsulants or one or more hydrophobic encapsulants, or a combination thereof.

13. (Currently amended) The method of claim 12, wherein at least one hydrophilic encapsulant is selected from the group consisting of carbohydrates, ~~including~~ sucrose; marker-tagged dextrans, ~~including~~ fluorescent dextrans from 1 kD up to 200 kD; therapeutic compositions,

~~including~~ doxorubicin or amphoterican B; dyes; indicators; protein or protein fragments, ~~including~~ catalase; ammonium sulfate; salts; and gene or gene fragments, ~~including~~ oligonucleotides.

14. (Currently amended) The method of claim 12, wherein at least one hydrophobic encapsulant is selected from the group consisting of PKH fluorescent dyes; therapeutic compositions, ~~including~~ taxol and anthracyclin; monosialoganglioside; fluorinated lipids; fluorescein-taxol; and fluorescent-dye modified copolymers.

15. (Original) The method of claim 12, wherein the at least one therapeutic composition is an anti-cancer drug selected from cytotoxic doxorubicin and taxol.

16. (Original) The method of claim 1, wherein the at least one encapsulant is encapsulated simultaneously with polymersome formation, or subsequent thereto.

17 – 20 (Cancelled)

21. (New) The method of claim 1, wherein the at least one encapsulant has a molecular weight greater than 1.0×10^5 Da.

22. (New) The method of claim 1, wherein the at least one encapsulant has a molecular weight of less than 1.0×10^2 Da.